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G84-688 Brown Patch Disease of Turfgrass (Revised June 1999)

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Brown Patch Disease of Turfgrass

This NebGuide describes the symptoms and disease cycle of brown patch and gives recommendations for its prevention and control through management, including use of fungicides.

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Brown patch of turfgrass is caused by the fungus *Rhizoctonia solani* Kuehn. All commonly cultivated turfgrasses in Nebraska are affected by this disease, but differences in susceptibility exist within cultivars of the various turfgrass species. Primary hosts are bentgrass, perennial ryegrass, tall fescue and annual bluegrass. Certain species of *Rhizoctonia* are capable of attacking turfgrass plants from seedling stage to mature plants and are pathogenic over a wide range of environmental conditions. In some literature, brown patch may be referred to as *Rhizoctonia* blight. In zoysiagrass, it is referred to as large brown patch.

Symptoms

Brown patch symptoms vary, depending primarily on turfgrass species and mowing height. The degree of turfgrass injury depends largely on susceptibility of the cultivar, management practices and weather conditions.

On home lawns, golf course fairways and similar turfs, field expression of the disease is the presence of roughly circular patches of dead and dying grass (*Figure 1*). Diseased areas may encompass large portions of the turf. Turf with these patches appears somewhat "sunken." The grass in the center of the diseased patches may be less affected, giving the appearance of the "frog-eye" symptom commonly associated with summer



Figure 1. Roughly circular patches typical of brown patch on taller-cut turfgrass.

patch. However, the presence of the characteristic brown patch leaf spot on individual blades should distinguish it from this disease. Also, the affected turf appears less matted than that affected by summer patch.

Green plants within the affected turf have grayish-colored leaf spots that are long, irregularly shaped and surrounded by a dark brown margin (*Figure 2*). Diagnosis of brown patch should be made not only on the characteristic leaf spot symptom, but also should include gross symptomatology of the affected turf, and, in some situations, culturing of the pathogen.

On bentgrass greens, symptoms appear as roughly circular, reddish-brown patches that vary in size from 6 to 8 inches to a foot or more in diameter (*Figure 3*). Infected grass blades first appear water-soaked and purplish-green. They soon die and turn light brown. Occasionally, a grayish "smoke ring" 1 to 2 inches wide and composed of wilting, webbed grass blades marks the advancing margin of the patch. The smoke ring is best observed in early morning while dew is present.

Disease Cycle

Rhizoctonia solani survives from year to year in the form of mycelium or bulbils (resting bodies of the fungus) in plant debris and thatch. As such, it also is capable of existing away from the host as a saprophyte. As average daily temperatures reach the mid-70s, the bulbil germinates and forms fungal hyphae, which spread through the soil surface and thatch. During humid, hot weather, the hyphae grow onto moist grass blades and enter the plant through wounds and stomates (natural leaf pores). Local spread is by mycelium bridging from plant to plant. Longer distance spread is by mycelium clinging to wet mower wheels during early morning mowing. This sometimes causes symptoms to appear in a wheel track pattern (*Figure 4*), rather than in the characteristic circular pattern.

Factors Favoring Brown Patch

Brown patch occurs on dense, heavily fertilized and watered turf in hot (above 85°F), humid weather when night temperatures remain above 60°F. Poorly drained soils, thick thatch and night irrigation lengthen the period of leaf wetness and promote greater infection. High levels of nitrogen and low levels of phosphorous or potassium may contribute to increased disease severity. Mowing with a dull mower blade frays leaf blade tips and causes excessive wounding that enhances infection through those frayed blade tips.



Figure 2. Irregularly-shaped leaf spot of brown patch (right) and bleached leaf spot of dollar spot.

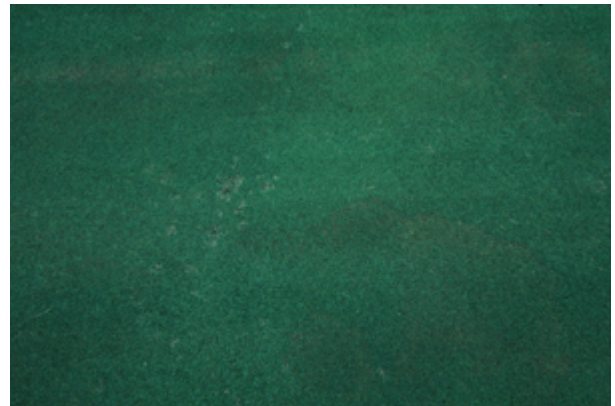


Figure 3. Brown patch symptoms on a bentgrass green.



Figure 4. Spread of brown patch by mowing.

Integrated Disease Management

- Avoid heavy, early spring and summer fertilization, particularly with soluble nitrogen.
- Avoid over fertilization of turfgrasses growing in shaded areas.
- Use slow-release nitrogen fertilizers. Fertilize to maintain adequate but not lush growth during the growing season. Properly fertilized turf will recover quicker from disease injury than will under-fertilized turf.
- Remove and dispose of clippings from infected areas or when conditions are conducive to disease development. Mulching mowers that chop clippings to 1/4 inch or less do not contribute to brown patch development.
- Prune woody landscape plantings and trees to allow better air movement and light penetration to reach the turfgrass canopy.
- Water infrequently, but deeply, in the early morning, and avoid late evening and night watering.
- When available, plant turfgrass cultivars with a known level of resistance to brown patch.
- Use a preventive fungicide program on high-value turfs with a history of brown patch. On other turfs, apply a registered fungicide at first evidence of the disease. Integrate fungicide treatments with other management practices to maximize their effectiveness.
- Provide good surface and subsurface water drainage to reduce humidity in the turf canopy.
- Manually remove dew in early morning by dragging a garden hose or rope laterally across the grass.
- Annually aerify to reduce thatch buildup.

Table I. Fungicides for the management of Rhizoctonia brown patch.*

<i>Common Name</i>	<i>Some Trade Names</i>	<i>Professional (P)/ Homeowner (H) Use</i>
Azoxystrobin	Heritage (Zeneca)	P
Benomyl	Benomyl (Hi Yield)	H
	Benomyl Lawn Fungicide (Bonide)	H
	Benomyl Systemic Fungicide (American)	H
	Benomyl Spray (Security)	H
Chloroneb	Chloroneb (Andersons)	P
	Fungicide V (Scotts)	P
	Teremec SP (PBI/Gordon)	P

	Terraneb SP (Kincaid)	P
Chlorothalonil**	Daconil 2787 (Zeneca)	P
	Daconil 2787 Weather Stik (Zeneca)	P
	Daconil Ultrex (Zeneca)	P
	Manicure (LESCO)	P
	Thalonil (Terra)	P
	Turf Fungicide (Lebanon)	P
	Chlorostar (Regal)	P
Cyproconazole	Sentinel (Novartis)	P
Fenarimol	Rubigan A.S. (Dow AgroSciences)	P
	Patchwork (Riverdale)	P
Flutolanil	ProStar (AgrEvo)	P
Iprodione	Chipco 26019 (Rhone-Poulenc)	P
	Chipco 26GT (Rhone-Poulenc)	P
	Fungicide X (Scotts)	P
Maneb	Pentathlon (Griffin)	P
Mancozeb	Fore (Rohm and Haas)	P/H
	Dithane (Rohm and Haas)	P
	Mancozeb (LESCO)	P
	Protect T/O (Cleary)	P
	Junction (Griffin)	P
	Mancozeb Flowable (Bonide)	H
	Maneb Plus (Green Light)	H
	Fore Lawn & Ornamental Fungicide Spray (Acme)	H
Myclobutanil	Eagle WSP (Rohm and Haas)	P
	Golden Eagle (Scotts)	P
PCNB	Defend 2F (Cleary)	P
	PCNB 75WP (Cleary)	P
	Engage (United Horticultural Supply)	P
	Penstar 15G, FLO (Scotts)	P
	Revere (LESCO)	P
	Terraclor, Turfcide, Turfcide 400 (Uniroyal)	P
Propiconazole	Banner MAXX (Novartis)	P

	Banner GL (Novartis)	P
	Spectracide Immunex Fungicide Concentrate (Spectrum)	H
Quartenary Ammonium Compounds	Physan 20 (Maril)	P
Thiophanate-methyl	3336 (Cleary)	
	Cavalier 2G, 50WSB, 4.5 F (LESCO)	P
	Fungo Flo, 50WSB Systemic Fungicide (Scotts)	P
	SysTec 1998 (Regal)	P
	Halt Systemic (Ferti-lome)	H
	Lawn Fungus Control (Scotts)	H
	Systemic Fungicide 3336 (Dragon)	H
	Bonomyl System Fungicide (Bonide)	H
Thiram	Spotrete 75WDG, F (Cleary)	P
	Lawn Disease Control (Bonide)	H
	Defiant (UCB)	P
Triadimefon	Bayleton (Bayer, Anderson, Lebanon)	P/H
	Granular Turf Fungicide (LESCO)	P
	Fungicide VII (Scotts)	P
	1% Turf Fungicide with Bayleton (Rockland, Bonide)	P/H
	Accost (United Horticultural Supply)	P
	Bayleton Systemic Fungicide (LESCO)	P
	Fungi-Fighter (Monterey)	P
	Fungisol (Opti-Gro)	P
	Lawn Fungicide, Bayleton 1G (Howard Johnson's)	H
	Fung-Away (Green Light)	H
Vinclozolin	Curalan (BASF)	P
	Touch, (LESCO)	P
	Vorlan DF (Scotts)	P
Chloroneb+thiophanate-methyl	Fungicide IX (Scotts)	P
Chloroneb+fenarimol	TwoSome Flowable Fungicide (LESCO)	P

Chlorothalonil+thiophanate-methyl	ConSyst (Regal)	P
	Spectro 90WDG (Cleary)	P
Propamocarb+chlorothalonil	LescoPar (LESCO)	P
Thiophanate-methyl+iprodione	Fluid Fungicide (Scotts)	P
	Turf Builders plus Fungicide	H
Thiophane-methyl+mancozeb	Duosan WP, WSB (Scotts)	P
Thiram+triadimefon	Fluid Fungicide III (Scotts)	P
Triadimefon+metalaxyl	Fluid Fungicide II (Scotts)	P
<p>*Fungicides listed in Table I represent the best information available. No criticism is intended of products not listed, nor is endorsement by the University of Nebraska given to those listed. Read and follow all product label directions.</p> <p>**Cannot be used on home lawns.</p>		

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